C S P The DOE **C**enter of Excellence for the **S**ynthesis and **P**rocessing of Advanced Materials

Summary of the 2004 Center Review
Germantown, MD
June 3-4, 2004

This Review was held at DOE in Germantown on June 3-4, 2004. The agenda is attached.

The attendees were:

TSG Members:	Eric Cross, *Penn State University,* Hylan Lyon, *Marlow Industries* Christian Mailhiot, *Lawrence Livermore Lab (DP)* Arthur Yang, *Arthur Yang Industrial Science & Technology Network* Paul Peercy, *Univ. of Wisconsin* John Stringer, *EPRI*
BES/Management & Staff:	Pat Dehmer Bob Gottschall Bill Oosterhuis and most of the DMS&E staff
Laboratory Representatives:	CSP Representatives, Project Coordinators and other presenters from all the Center's participating labs.

Presentations were made summarizing the accomplishments of all eight on-going Center projects.

Feedback from the Technology Steering Group (TSG)

Members of TSG caucused at the end of the Review presentations and then provided, through their spokesman, Paul Peercy, the following comments and observations:

- CSP continues to be successful. The CSP program has changed the culture of the DOE labs from one of competition to one of collaboration.

- CSP projects have pulled together multiple individuals/independent research activities from multiple labs to create coordinated entities including synthesis and processing, characterization and theory. In the process the researchers involved have access to fantastic tools and resourses.

- The quality of the science is generally "very high", "world-class," "impressive" and leading edge in many cases.

- CSP has been effective in accelerating the rate of scientific advance through these collaborations and the close coupling of theory and experiments with state of the art facilities.

- CSP was impressed with the quality of the proposals for new projects (including the pre-proposals for new projects (including the pre-proposals that were considered in December at the MRS meeting). TSG sees the large interest and effort that has gone into the proposals as a sign of the success of CSP. It is amazing how big a fish you are landing with such a small amount of bait.

- TSG asked itself if the criteria used to select projects should be the same criteria TSG uses to evaluate performance. Thus, the next two bullets.

- TSG also discussed the way in which they would like to see CSP projects impact technology. In some of the programs reviewed, such as the ferroelectric random access memories and magnetics, the link to technology impact was quite clear. But at the same time, TSG felt that it is not necessary that all projects be on track "for getting an R&D 100 award." Rather, what is important is that the principal investigators in the project be able to articulate how the work will, or might, be able to impact technology in the future. TSG members noted two early studies of the connection of technology to basic science (the "Traces" study and "Project Hindsight") and commented that a key issue at each decision point in progression of science to technology is the knowledge of what can be done and what does not work. Thus, at the end of a CSP project it is very important to identify the key concepts that have been learned and the key problems that have been solved. What didn't work is also important.

- Concerning the progression of a project, by the second year, projects should be very well focused, and by the end of a project it should be possible to show how the work will be carried through to "real-world" applications. In particular, with regards to nanoscience, it should be clear where length scale matters and what the performance benefit vs. cost will be as nanotechnologies are scaled up. "Don't just leave us with a whole lot of enthusiasm without the thought of how scale-up will occur."

- CSP projects need to couple to the DOE nanoscience and technology centers, where appropriate.

- TSG noted that the number of participants in many of the projects is quite large and asked whether CSP has thought through what is the optimum size for a project.

- Finally, TSG felt that many in their panel would welcome the opportunity to participate in CSP project workshops. They would like to see an improved system for notifying them of these events, beyond the current system of listing the notices on the CSP website.

Summary of Laboratories' CSP Representatives Discussions

The Lab's CSP representatives met briefly while TSG was caucusing. The discussion focused briefly on the following:

- The date for next year's annual CSP review is set for the second week of June 2005 (June 9 and 10).

- A call will be issued in early Fall for pre-proposals to replace two CSP projects that will graduate at the end of FY05.

- Motivated by Pat Dehmer's goal for BES to support only work that "leads the world in science", the Reps discussed the matter with regards to CSP and will continue to discuss it at future meetings. Important to achieving this goal is for the Labs to have leading world scientists and attract them to CSP projects. This goal will be emphasized in planning activities and workshops for new CSP projects.

- The question of what CSP wants to achieve for the next 5-10 years beyond what it is presently doing was raised and discussed. Clearly Pat's "world leadership" is important here. Among relevant points that came up are the following:

  - New ideas come out of Center projects that can be exploited for bigger things including world leadership.
  - CSP projects have and will continue to develop drivers for future science in the NanoScience Centers.
  - CSP projects can provide compelling drivers to advance the state-of-the-art of facilities including major facilities. (CSP should also challenge projects to make better use of DOE major facilities).

- CSP will broaden the distribution of its *Research Briefs*.

- The CSP Reps will again meet in Boston (MRS) on November 30, 2004 to evaluate pre-proposals and conduct other business.

George Samara